AMENDMENT

In the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application. Claims 1-3 and 8-11 have been canceled. Please add new claims 25-35. Currently amended claims are shown with additions underlined and deletions in ~~strikethrough text~~. No new matter is added by this amendment.

1.-3. (Canceled).

4. (Currently amended) The method of claim ~~1,~~25, wherein the ~~preparing a~~ mixture of molecules includes ~~preparing~~ a mixture of isolated peptides.

5. (Currently amended) The method of claim ~~1,~~25, wherein the ~~preparing a~~ mixture of molecules includes ~~preparing a mixture of~~ molecules that are water soluble and have a molecular weight greater than 400.

6. (Currently amended) The method of claim ~~1,~~25, wherein the ~~obtaining data using the~~ bioassay ~~process~~ includes ~~obtaining data using~~ an electrospray process.

7. (Currently amended) The method of claim ~~1,~~25, wherein the ~~obtaining data using the~~ bioassay ~~process~~ includes ~~obtaining data using~~ a biochip-based process.

8.-11. (Canceled)

12. (Currently amended) The method of claim ~~8, further comprising:~~ 25, wherein the determining ~~when the obtained data falls~~the degree of error includes determining whether the test centroid is within a predetermined distance of ~~a~~the control centroid~~, the centroid defining the predetermined model~~.

13. (Currently amended) The method of claim 12, wherein the determining ~~when~~whether the ~~obtained data falls~~test centroid is within ~~the~~a predetermined distance ~~including~~includes one of: determining that the bioassay process is functioning properly when the ~~obtained data falls~~test centroid is within or is equal to the predetermined distance from the control centroid, and determining that the bioassay process is not functioning properly when the ~~obtained data falls outside of~~test centroid is beyond the predetermined distance from the control centroid.

14. (Currently amended) The method of claim ~~8,~~25, wherein each of the ~~predetermined~~ features ~~includes~~is a mass-to-charge ratio ~~and a magnitude~~.

15. (Currently amended) A method of testing a bioassay process against a control model, the method comprising:

preparing a mixture of molecules;

dividing the mixture of molecules into a ~~number~~plurality of aliquots;

preserving the plurality of aliquots ~~of the mixture of molecules~~;

retrieving ~~at least one~~a first aliquot, the first aliquot being a control aliquot ~~of the preserved mixture~~;

obtaining data from the ~~at least one~~control aliquot ~~of the preserved mixture~~ using the bioassay process, the data including values for n features, which collectively define a control centroid in an n-dimentional space;

~~computing a location of a centroid in n-dimensional space based on the data obtained form the at least one aliquot of the preserved mixture, the location of the centroid in n-dimensional space defining the control model;~~

subsequently retrieving ~~an aliquot of the preserved molecular mixture at a time following the computing of the control model~~a second aliquot, the second aliquot being a test aliquot;

obtaining data from the test aliquot~~retrieved molecular mixture~~ using the bioassay process, the data ~~having a plurality of~~including values for the n ~~predetermined~~ features, which collectively define a test centroid in the n-dimensional space; and

determining a ~~distance based on a plotted location of the predetermined features and a predetermined centroid, the centroid being defined in~~degree of error in the bioassay process based on a distance in the n-dimensional space between the test centroid and the control centroid.

16. (Currently amended) The method of claim 15, wherein the obtaining data from the control aliquot using the bioassay process includes using an electrospray process.

17. (Currently amended) The method of claim 15, wherein the obtaining data from the control aliquot using the bioassay process includes using a biochip.

18. (Currently amended) The method of claim 15, wherein the obtaining data from the control aliquot~~computing a location of a centroid in n-dimensional space~~ includes:

selecting ~~at least one feature~~a subset of n features from a plurality of features~~, the plurality of features being~~ associated with the control aliquot~~mixture of molecules~~;

~~plotting the at least one feature in n-dimensional space, where n is equal to the number of features selected from the plurality of features; and computing a location of a centroid based on plots obtained from the plotting~~.

19. (Currently amended) The method of claim 15, wherein ~~the at least one~~each feature ~~of the plurality of features are defined by~~is a mass-to-charge ratio and the value of each feature is a magnitude.

20. (Currently amended) The method of claim 15, wherein the retrieving ~~at least~~a first ~~one~~ aliquot includes retrieving two or more aliquots ~~of the mixture of molecules~~.

21. (Currently amended) A quality control method for a bioassay process, comprising:

retrieving ~~an~~a test aliquot of a preserved molecular mixture;

analyzing data from the ~~retrieved molecular mixture~~test aliquot using a bioassay process;

comparing a test set of ~~predetermined~~ features of the ~~retrieved molecular mixture~~test aliquot with a control set of ~~predetermined~~ features~~, the~~ based on a control aliquot from the

preserved molecular mixture, the control set of ~~predetermined~~ features defining a control centroid in an n-dimensional space, the test set of features defining a test centroid in the n-dimensional space, the test set of ~~predetermined~~ features of the retrieved mixture being the same as the control set of ~~predetermined~~ features; and

determining a degree of error in the bioassay process based on a difference between the position of ~~a control centroid, the position of the control centroid being based on the control set of predetermined features and the position of a test centroid, the position of the test centroid being based on the test set of predetermined features of the retrieved molecular mixture~~the test centroid and the position of the control centroid.

22. (Currently amended) The method of claim 21, wherein said features are mass-to-charge ratios and wherein said comparing includes comparing ~~a set of mass-to-charge ratios and~~ magnitudes of each of the test set of ~~predetermined features with the~~ mass-to-charge ratios ~~and~~with the magnitudes of the control set of ~~predetermined features~~mass-to-charge ratios.

23. (Currently amended) The method of claim 21, wherein the analyzing data from the test aliquot~~molecular mixture~~ using a bioassay process includes analyzing data from the test aliquot~~molecular mixture~~ using an electrospray process.

24. (Currently amended) The method of claim 21, wherein the analyzing data from the test aliquot~~molecular mixture~~ using a bioassay process includes analyzing data from the test aliquot~~molecular mixture~~ using a biochip.

25. (New) A quality control method for a bioassay that generates spectral data, comprising:

providing a location in an n-dimensional space of a control centroid associated with control spectral data generated from a first aliquot of a prepared mixture of molecules;

generating test spectral data from a second aliquot of the mixture;

computing a location in the n-dimensional space of a test centroid associated with the test spectral data;

comparing the test centroid to the control centroid to determine the displacement in n-dimensional space of the test centroid from the control centroid; and

determining a degree of error between the test spectral data and the control spectral data.

26. (New) The quality control method of claim 25, wherein the mixture of molecules is a biological sample.

27. (New) The quality control method of claim 25, wherein the spectral data are generated by a mass spectrometer.

28. (New) The quality control method of claim 25, further comprising determining whether the degree of error indicates a need for change on one or more of the components of the bioassay selected from the group consisting of electrospray apparatus, biochip, diluents, and reagents.

29. (New) The quality control method of claim 25, further comprising repeating the generating test spectral data and computing a location for multiple aliquots of the mixture of molecules over time to monitor performance of the bioassay.

30. (New) The quality control method of claim 25, wherein if the displacement of the test centroid from the control centroid exceeds two standard deviations, the degree of error is determined to be unacceptably large.

31. (New) The quality control method of claim 21, wherein if the displacement of the test centroid from the control centroid exceeds two standard deviations, the degree of error is determined to be unacceptably large.

32. (New) The quality control method of claim 25, wherein the mixture of molecules is selected from the group consisting of naturally-occurring and non-naturally-occurring molecules.

33. (New) A quality control method for a bioassay that generates spectral data, comprising:

providing a location in an n-dimensional space of a control centroid associated with control spectral data generated from a first aliquot of a prepared mixture of molecules;

generating test spectral data from a second aliquot of the mixture;

computing a location in the n-dimensional space of a test centroid associated with the test spectral data; and

comparing the test centroid to the control centroid to determine the displacement in n-dimensional space of the test centroid from the control centroid; wherein the magnitude of the displacement is an indicator of the quality of the test spectral data.

34. (New) A quality control method for a bioassay that generates spectral data, comprising:

providing a location in an n-dimensional space of a control centroid associated with control spectral data generated from a first aliquot of a prepared mixture of molecules;

generating test spectral data from a second aliquot of the mixture;

computing a location in the n-dimensional space of a test centroid associated with the test spectral data;

comparing the test centroid to the control centroid to determine the displacement in n-dimensional space of the test centroid from the control centroid; wherein the magnitude of the displacement is an indicator as to whether the apparatus that generates the test spectral data should be recalibrated to reduce the displacement.

35. (New) A quality control method for a bioassay that generates spectral data, comprising:

providing a location in an n-dimensional space of a control centroid associated with control spectral data generated from a first aliquot of a prepared mixture of molecules;

providing a location in an n-dimensional space of a test centroid associated with test spectral data generated from a second aliquot of the prepared mixture of molecules;

comparing the test centroid to the control centroid to determine the displacement in n-dimensional space of the test centroid from the control centroid; and

determining a degree of error between the test spectral data and the control spectral data.